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Abstract

The paper attempts to analyze the impact of trade liberalization policy, in terms of FDI, on the level of informal competitive wage rate as well as on the size of the informal sectors of a developing economy with dualistic economic structure in a general equilibrium framework. The wage rate earned by the informal workers has been considered here as a proxy for their living standard. In this paper it is found that FDI raises the level of wage rate of the informal workers and consequently raises their standard of living. It is also found in this paper that FDI expands both formal and informal manufacturing sectors in the urban areas whereas it contracts the rural agricultural informal sector. In this structure an attempt has also been made to analyze the effects on the welfare level of the economy for a drive towards liberalization through FDI by assuming Sen (1974) type social welfare function which considers inequality in income distribution.

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1. Introduction:

The developing economies are characterized by dualistic structures in the form of a highly formalized organized sector along with an unorganized informal sector. This is reflected in the labour markets of these economies by a formidable reservoir of workers employed in the 'informal sector'. The term 'informal sector' came into wide usage during the last two decades. Before that informal sector was considered as a transitory phenomenon, which was expected to fade away as the formal sector of the economy created more and more jobs. Lewis (1954), Fei and Ranis(1964), Harris-Todaro (1970) have used the concept of 'surplus labour' and have explained how this will facilitate the transition of the economies from agriculture to industry or from rural to urban in different ways. All these theories have expected that the informal sector would wither away with the passage of time.

However, economic recession, structural adjustment policies, continued high rate of urbanization, technical advancement and population growth in the developing economies, have forced the modern sector enterprises to retrench workers drastically. These workers have been absorbed by the informal sector of the economy alone, which has led to an unusual expansion of the informal sector in the developing economies. Therefore it is to be believed that in many years to come, informal sector will be an

expanding part of developing economies and this belief has forced the researchers and policy makers to recognize the importance of informal sector in developing economies.

The term 'informal sector' has been defined in the literature in various ways. Mention may be made of the pioneer work by Hart (1973), who has defined the term 'informal sector' to explain a dichotomy in the context of a dual model for urban workers in Ghana. An alternative definition of the informal sector has also been provided by International Labor Organization (ILO) in the early 1970s. According to ILO there is no precise definition of informal sector, rather it has some common characteristics like easy entry for the new enterprises, small-scale of operation, family ownership, reliance on indigenous resources, labour intensive and adaptive technology, skills acquired outside the formal system and operation in unregulated and competitive markets. The informal sector in a regulatory framework has been studied by De Soto (1989). In this approach the legal status is the main element which distinguishes informal from formal activities. Papola (1981) has suggested that the distinction between the formal and informal sector enterprises can be made on the basis of mode of production, organization, scale of operation, technology, productivity and labour markets.

At the empirical level the role of informal sector in developing economies have been studied by Papola (1981), Romatet (1983), Das (2000), Banerjee (1985), Fields (1990), Cole and Sanders (1985), Agenor (1996), etc. Papola (1981) has discussed in general the various features of an urban informal sector in a developing economy and has considered the urban informal sector of the city of Ahmedabad in India as a case study.

Similarly Romatet (1983) has selected some areas of the city of Calcutta in order to study the features as well as the problems faced by the informal sectors of a developing economy. Das (2000) has tried to study the types of employment existing in the informal sector of a developing economy and has tried to analyze the contribution of informal sectors to the developing economy, by providing employment and income to the migrant laboures. Agenor (1996) on the basis of his empirical findings has estimated that more than 50 to 60 percent of labour force of the developing economies usually operates in the non-unionized sectors and often under flexible wage conditions.

On the basis of these empirical findings, a large number of theoretical works have been developed to provide suitable theoretical structures to examine the role of informal sectors in developing economies from different angles. The theoretical literature again consists of both the competitive general equilibrium framework and the partial equilibrium framework with imperfection in the market structure. But, here we would only focus on the studies based on competitive general equilibrium framework. Important works in this line are done by Chandra and Khan (1993), Gupta (1993, 1997a, 1997c), Beladi and Yabuchi (2001), Gupta and Basu (2004), Chaudhuri (2000, 2003), Chaudhuri and Mukhopadhyay (2002) etc.

The purpose of this paper is to examine the impact of liberalization, in the form of an increase in foreign capital inflow (or foreign direct investment), on the level of informal competitive wage rate as well as on the size of the informal segment of the economy. In the present structure an attempt has also been made to analyze the effects on

the levels of inequality as well as social welfare for a drive towards liberalization. The effect on welfare has been examined using Sen (1974) type social welfare function which links Gini measure of inequality and social welfare. The motivation behind the present study generates from the fact that with growing importance of informal sectors in the developing economies, it is necessary to examine the impact of liberalization policies on the size of these sectors. It is also important to analyze the impact of economic reform policies on the standard of living of the workers engaged in the informal sectors in the present era when the importance of informal sector is rising over time in the developing economies. As the standard of living of workers and wage earnings are positively correlated, the wage rate earned by the informal workers has been considered here as a proxy for their living standard. The vast existing literature has not addressed this issue adequately. Some exceptional works done in this line are by Kar and Marjit (2001), Marjit and Beladi (2002), Marjit and Kar (2004), Marjit (2003), Marjit, Kar and Parkar (2004), Marjit and Maiti (2005), Chaudhuri and Banerjee (2006), Marjit, Kar and Acharyya(2007) , Marjit, Kar and Beladi(2007), Chaudhuri and Mukhopadhyay (2010) Marjit and Kar(2011) etc. Apart from this the attempt to capture inequality and welfare by using a welfare function, which takes into account of Gini measure of inequality, is something new in the context of informal sector. In the context of income inequality and welfare in general equilibrium the most important work is the paper by Gupta (1994), though Gupta (1994) has not considered income inequality and welfare in the context of the informal sector.[1] By linking informal sector with income inequality and welfare our paper has tried to fill up the lacuna that exists in the literature as mentioned earlier.

[1] However, Gupta (1997b) is an exception. In this paper Gupta (1997b) has considered both income inequality and poverty in the context of informal sector, though he has not considered the welfare measure

In the present paper a three-sector full employment model has been considered.[2] It has been assumed here that there are two informal sectors in the economy- the intermediate good producing informal manufacturing sector and the other is the agricultural sector. The intermediate good producing informal manufacturing sector (sector‘ z ’) is assumed to produce a ‘relatively low-skilled’ manufactured product which is used by the formal manufacturing sector of the economy (sector ‘ y ’) as a factor in fixed proportion. In short, sector ‘ z ’ produces a non-traded intermediate product, for sector ‘ y ’, i.e. the formal manufacturing sector [3], using fixed amounts of labour, formal capital and informal capital. The other informal sector in the economy, i.e. the agricultural (sector ‘ x ’), produces a traditional agricultural product with labour and informal capital. The formal manufacturing sector of the economy, sector ‘ y ’, is assumed to produce its product using labour, capital and the intermediate product which is produced in sector ‘ z ’. The products of sector ‘ x ’ and sector ‘ y ’ are assumed to be traded final commodities. It is assumed here that the formal sector of the economy employs workers at a contractual unionized wage rate which is much higher than the

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of Sen (1974) in the context of informal sector. The present paper has borrowed Sen's(1974) welfare function from Gupta's (1994) work. The fact that this paper is different from Gupta (1994) is already mentioned earlier. We would also like to point out in this context that Gupta's (1997) work has focused on Gini measure of inequality in the context of poverty by taking into account of informal sector in a Harris-Todaro(1970) framework. The present paper is widely different from Gupta's (1997b) model in two major ways. First, our paper has not considered a Harris-Todaro(1970) framework. Second the equational specifications of the model are also different from Gupta (1997b). Third, unlike Gupta (1997b), we have taken into account Sen(1974) type welfare function.

[2] This paper has been built in line with the work done by Mitra (2010), though there are lots of differences between the present paper and Mitra (2010). First the modelling of the informal sector is different from the modelling of the informal sector that we find in Mitra (2010). Moreover, the present paper deals with inequality and welfare which are totally missing in Mitra (2010).

[3] This assumption is quite realistic for developing countries where local outsourcing is a very common practice. Many big industries, MNCs etc. outsource some stages of their production processes to local informal industries. See Gupta and Basu (2004).

market determined competitive wage rate that is received by the workers engaged in the two informal sectors. Again in this model total formal capital stock consists of both domestic capital and foreign capital and they are assumed to be perfect substitutes. [4]

This paper attempts to show that trade liberalization, in the form of foreign direct investment (FDI), raises the level of wage rate of the informal workers and hence improves their standard of living. Moreover it wants to examine whether FDI creates a polarization in the economy. Finally the paper attempts to examine the impact of FDI on income inequality and social welfare. It would be interesting if one can find out the conditions in a developing economy under which FDI can reduce income inequality and improve welfare. The present paper can be considered as a first attempt in this regard.

The paper is organized in the following manner. The model is described in Section 2. Section 3 deals with some comparative static results related to the impact of FDI on the level of informal competitive wage rate as well as on the welfare level of the economy. Finally, the concluding remarks are made in Section 4.

2. The Model:

A small open economy has been considered here which is basically classified into three sectors - the agricultural (rural) sector 'x', the formal manufacturing (urban) sector 'y' and the informal manufacturing (urban) sector 'z'. The formal manufacturing sector and the agricultural sector produce final products but the informal manufacturing

[4] This is a standard assumption that is borrowed from the literature. See for example the works by Chandra and Khan (1993), Gupta(1997a),Chaudhuri (2003),Chaudhuri and Mukhopadhyay(2002,2010) etc.

sector produces an intermediate good for the formal manufacturing sector ' y '. Following the assumptions regarding the 'informal labour', the agricultural sector and the informal manufacturing sector constitute the informal segment of the economy. The agricultural sector ' x ' uses informal capital and labour whereas the informal manufacturing sector ' z ' uses fixed amount of formal capital with labour and informal capital [5] to produce their products.[6] The fact that the informal manufacturing sector uses both formal capital and informal capital follows from the fact that the formal sector for its survival helps some segments of the informal manufacturing sector by providing limited amount of formal capital, though the latter sectors are mainly dependent on informal capital. The formal manufacturing sector ' y ', apart from capital and labour, uses the product of informal manufacturing sector as an intermediate input to produce its product. Therefore, in this model informal capital is mobile between the two informal sectors of the economy, i.e. sectors ' x ' and ' z '. On the other hand formal capital is mobile between sectors ' y ' and ' z '. In this model total formal capital consist of both domestic capital and foreign capital.[7] Finally labour is considered to be mobile among all the three sectors in the economy.

It is assumed here that in the formal sector of the economy (sector ' y '), there exists effective wage legislation and unionization of labour, due to which the wage rate of the workers of this sector, $\overline{w}$, is given exogenously. The workers engaged in the

[5] One may also consider land instead of informal capital which is mobile between the two informal sectors ' x ' and ' z '.The results of the model will remain unchanged in that case.
[6] Fixed coefficient type of production function for the informal manufacturing sector is nothing but a simplifying assumption.
[7] Out of the total formal capital the informal manufacturing sector uses only a limited amount of domestic capital.

informal segment of the economy (sector 'x' and sector 'z') receive market determined wage rate, w, which is much lower than the unionized wage rate of the formal sector.

Due to the small open economy assumption, prices of the final goods producing sectors (sector 'x' and sector 'y') are internationally given. As the product of sector 'z' is fully utilized as an intermediate product by sector 'y', it is internationally non- traded and its price is determined within the economy. Sector 'y' uses the product of sector 'z'on the basis of a fixed input-output ratio[8]; moreover, unit requirement of informal capital in sector 'z' is assumed to be constant. For all the other inputs used by various sectors we have a variable- coefficient type of technology. The input-output ratios can be expressed as functions of factor prices. Production function in each sector exhibits constant returns to scale (CRS) with diminishing marginal productivity to each variable input.

The following notations are used to describe the equational structure of the model.

$\overline{w}$ = fixed formal wage rate

w = market determined informal wage rate

r_T = return on informal capital

r = return to capital

X = output of the agricultural sector, 'x'.

Y = output of the formal manufacturing sector, 'y'.

Z = output of the informal intermediate good producing sector, 'z'.

[8] It implies that the input output coefficient a_{zy} is fixed. See Gupta and Basu (2004).

P_j = price of the j^{th} sector, where $j = x, y, z$

T = total supply of informal capital stock

L = total labour force

K = aggregate formal capital stock of the economy (both domestic and foreign).

a_{ij} = quantity of i^{th} input required to produce one unit of output of the j^{th} sector,

where $i = T, L, K, Z$; $j = x, y, z$

θ_{ij} = distributive share of i^{th} input in the j^{th} sector, where $i = T, L, K, Z$; $j = x, y, z$

λ_{ij} = proportion of i^{th} input used in sector j, where $i = T, L, K, Z$; $j = x, y, z$

σ_j = elasticity of substitution between factors in the j^{th} sector, where $j = x, y, z$

^ = proportionate change.

The competitive equilibrium conditions are given by the following three equations:

$$P_X = a_{LX} w + a_{TX} r_T \tag{1}$$

$$P_Y = a_{LY} \overline{w} + a_{KY} r + a_{ZY} P_Z \tag{2}$$

$$P_Z = a_{LZ} w + a_{KZ} r + a_{TZ} r_T \tag{3}$$

Full-employment conditions are given by the following equations:

$$a_{LX} X + a_{LY} Y + a_{LZ} Z = L \tag{4}$$

$$a_{KY} Y + a_{KZ} Z = K = K_D + K_F \tag{5}$$

$$a_{TX} X + a_{TZ} Z = T \tag{6}$$

$$a_{ZY} Y = Z \tag{7}$$

In this model there are 7 endogenous variables like w, r_T, r, P_Z, X, Y, Z which are to be solved from 7 equations. Thus the system is determinable.

Here equations (1), (2) and (3) constitute the price system and the rest of the equations form the output system. It may be noted here that the system does not satisfy the decomposable property since the four unknown input prices, w, r_T, r and P_Z, cannot be determined from the price system alone.

The working of the model is simple. Let us start from any arbitrary value of P_Z. For any arbitrary value of P_Z and given P_Y, r can be solved from equation (2) in terms of P_Z. Given P_X, w can be determined in terms of r_T from equation (1). Then from equation (3), r_T can be expressed in terms of P_Z. Once factor prices are determined the input-output coefficients can also be determined in terms of P_Z. Next, using equation (6) and by solving equations (4) and (5) simultaneously, Y and Z can be determined in terms of P_Z. Finally equilibrium value of P_Z can be determined from equation (7).

The model can be analyzed in the following manner: From equations (1) and (2) we find that $w = w(r_T)$ and $r = r(P_Z)$ respectively, where $\frac{\partial w}{\partial r_T} < 0$ and $\frac{\partial r}{\partial P_Z} < 0$, given the international prices of the traded final commodities and the formal sector wage rate. Now putting $w = w(r_T)$ and $r = r(P_Z)$ in equation (3) we can obtain r_T as a function P_Z i.e. $r_T = r_T(P_Z)$. It is assumed here that r and r_T moves in the same direction

in the economy.[9]This assumption is realistic but is crucial for our model. Therefore, we get $\frac{\partial r_T}{\partial P_Z} < 0$. Finally we get that $w = w\{r_T(P_Z)\} = w(P_Z)$ where $\frac{\partial w}{\partial P_Z} > 0$. In this way we can express each factor prices as a function of P_Z and thus we have boiled down all the variable input-output coefficients as a function of P_Z alone.

Now from equation (6) we can derive the value of X in terms of Z and P_Z, given the total informal capital supply, T, in the economy, as

$$X = \frac{T - a_{TZ}Z}{a_{TX}(P_Z)} \tag{6.1}$$

Using equations (6.1) and (7) we can rewrite equation (4) as,

$$a_{LX}(P_Z)\left(\frac{T - a_{TZ}Z}{a_{TX}(P_Z)}\right) + a_{LY}(P_Z)Y + a_{LZ}(P_Z)a_{ZY}Y = L \tag{4.1}$$

Equation (4.1) may be interpreted as the locus of all such combinations of P_Z and Y so that the labour market is in equilibrium.

Differentiating equation (4.1) we get,

$$\left.\frac{dY}{dP_Z}\right|_{LL} = -\frac{\frac{a'_{LX}(P_Z)a_{TX}(P_Z) - a'_{TX}(P_Z)a_{LX}(P_Z)}{a^2_{TX}(r_T)}(T - a_{TZ}a_{ZY}Y) + (a'_{LY}(P_Z) + a'_{LZ}(P_Z)a_{ZY})Y}{a_{LY}(P_Z) + a_{TZ}a_{ZY}\left\{\frac{a_{LZ}(P_Z)}{a_{TZ}} - \frac{a_{LX}(P_Z)}{a_{TX}(P_Z)}\right\}} > 0 \tag{8}$$

where $a'_{LX}(P_Z) < 0,\ a'_{TX}(P_Z) > 0,\ a'_{LY}(P_Z) < 0, a'_{LZ}(P_Z) < 0$ and $(T - a_{TZ}a_{ZY}Y) = a_{TX}X > 0$.

[9] It is empirically observed in any developing economy. Both formal and informal interest rates (also interpreted as rates of return of formal and informal capital) move in the same direction.

Equation (4.1) is shown as the LL locus in figure 1 which is a positively sloped curve.

Proceeding in the same way, equation (5) can be written as,

$$a_{KY}(P_Z)Y + a_{KZ}(P_Z)a_{ZY}Y = K \tag{5.1}$$

Equation (5.1) can be interpreted as locus of all such combinations of P_Z and Y so that the formal capital market is in equilibrium.

Differentiating equation (5.1) we get,

$$\left.\frac{dY}{dP_Z}\right|_{KK} = -\frac{\left(a'_{KY}(P_Z) + a'_{KZ}(P_Z)a_{ZY}\right)Y}{\left(a_{KY}(P_Z) + a_{KZ}(P_Z)a_{ZY}\right)} < 0 \tag{9}$$

where $a'_{KY}(P_Z) > 0$ and $a'_{KZ}(P_Z) > 0$.

Equation (5.1) is depicted in figure 1 as KK locus which is a negatively sloped curve.

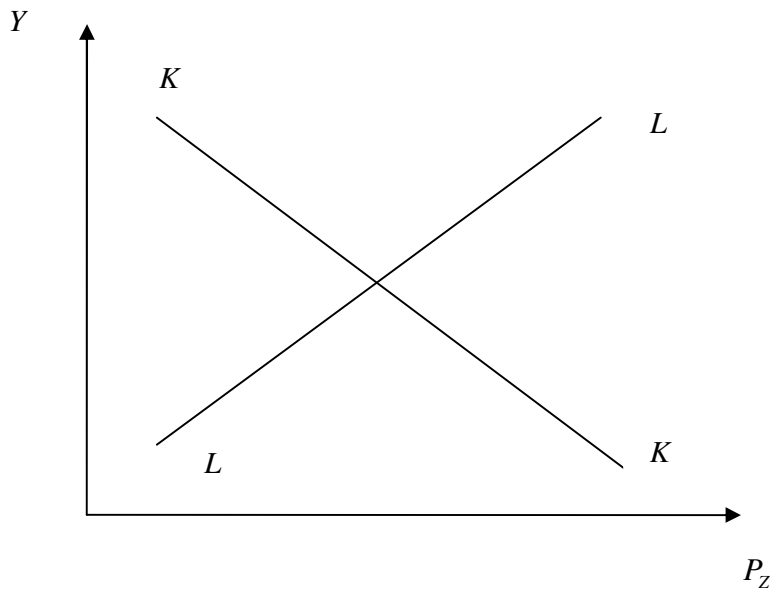

Figure 1

The intersection of LL locus and KK locus in figure 1 gives us the equilibrium values of P_Z and Y. Once P_Z is known, all other factor prices, (w, r_T and r) are also known. Thus the input-output ratios are known. Finally, when input-output ratios and Y are known, Z and X can be determined from equations (7) and (6) respectively.

3. Drive towards Liberalization:

3.1. FDI and Informal Wage

In this section the impact of liberalization on the level of market determined competitive wage rate (informal wage) which is received by the workers engaged in the informal segment of the economy and also on the size of the informal sectors has been considered. In this model the drive towards liberalization is examined through FDI which has been captured in terms of an inflow of foreign capital in the economy. An inflow of foreign capital causes a change in output levels and also a change in the factor prices in our model.

In figure 1 we find that FDI, in the form of an inflow of foreign capital, leads to an increase in the formal capital endowment of the economy. This shifts the KK locus upward. However, there will be no movement of the LL locus as a result of FDI. Hence a new equilibrium has been obtained at the intersection of the new KK locus and the LL locus, where both Y and P_Z are above than their previous equilibrium levels. This is shown in figure 2.

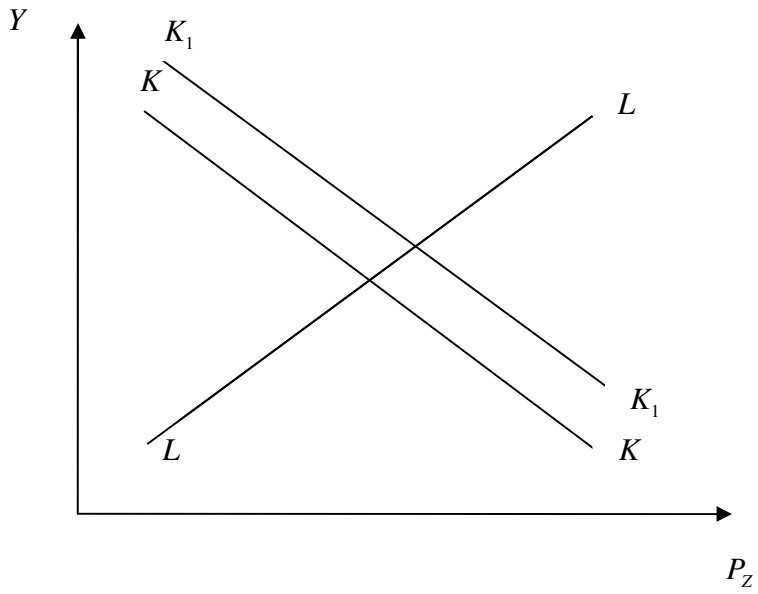

Figure 2

From the above diagram we find that due to FDI the size of the formal manufacturing sector ' y ', expands which implies, from equation (7), also an expansion of the informal intermediate good producing sector ' z '. Therefore, given the informal capital and labour endowments of the economy, sector ' x ' must contract. Again we find that for an increase in the supply of foreign capital, price of the intermediate good increases. Next we have to examine the impact on the factor prices. In this model w and P_Z are positively related whereas both r and r_T are inversely related with P_Z. Thus with a rise in P_Z due to FDI we find that w rises whereas both r and r_T fall. In other words, the competitive wage rate of the workers in the informal sector, w , increases whereas rate of return or rate of interest on informal capital, r_T , and rate of return or rate of interest on formal capital, r , decreases due to FDI.

These results may be interpreted in economic terms in the following manner. From our equational structure of the model we find that equation (5) (or more specifically equation (5.1)) along with equation (7) implies both the direct and the indirect requirement of FDI by the formal manufacturing sector in the economy. So for given price of the informal intermediate product, an increase in the level of foreign capital inflow or FDI raises the output of the formal manufacturing sector. Again, as the formal manufacturing sector is dependent on the intermediate informal sector an expansion of the former leads to an automatic expansion of the latter. This is explained in terms of equation (7). Therefore, both sectors ' y ' and ' z ' expand. Now for expansion of the two sectors, ' y ' and ' z ', more labour and informal capital (for sector ' z ' only) are required [10] which is met from sector ' x ' and consequently sector ' x ', the agricultural sector, contracts, given the labour and informal capital endowments in the economy. Therefore, it is found here that FDI leads to an expansion of the intermediate good producing informal manufacturing sector along with the expansion of the formal manufactuing sector and a contraction of the agricultural good producing informal sector in the economy. Consequently, there is a tendency for higher allocation of labour force to the formal and informal manufacturing sector (usually the urban sector of the economy) and fewer workers are available for the (rural) agricultural sector in the economy. Hence FDI creates a situation of polarization in the economy.

[10] In fact more informal capital required by sector ' z ' implies more informal capital is required indirectly by sector ' y ' as these two sectors are interdependent on each other.

We have considered the above movements for a given price of the product of the intermediate manufacturing sector. With the increase in the demand for the product of informal manufacturing sector by the formal manufacturing sector as a result of FDI, the price of the former product i.e. P_Z increases. Again, FDI results in an increase in the total capital endowment of the economy as a whole. This creates a downward pressure on the rate of return of capital, r, in the economy. It is assumed that the rates on return on both informal capital and formal capital move in the same direction. So, when r falls, r_T also falls. With the increase in P_Z and fall in both r and r_T, we find from equation (3) that to maintain the zero profitability condition in the informal non-traded intermediate sector, the informal competitive wage rate, w, must increase. Finally, with a rise in w and fall in r, the zero profitability condition in the agricultural sector is also maintained. Therefore, it is found here that due to FDI the wage rate (w) received by the informal workers increases leading to an improvement in their standard of living as the wage rate earned by the informal workers has been considered in this model as a proxy for their living standard.

The above results can be summarized in the form of following proposition:

Proposition 1:- *Trade liberalization in the form of FDI in a small open economy raises the informal wage rate and consequently the standard of living of the informal workers in the economy. Along with this such an FDI creates a polarization in the economy.*

3.2. FDI, Inequality and Welfare:

We now consider the impact of FDI on inequality and welfare when the foreign capital income is fully repatriated. Following Gupta (1994a) and also Gupta and Gupta (2010) it is assumed in this paper that there exists two income groups among the working class in the society: (i) the formal sector workers who earn the wage rate, $\overline{w}$ and (ii) the informal sector workers who earn the competitive wage rate, w. It is also assumed here that the *workers are the owners of all types of capital stock* (i.e. both informal and formal capital) and there is *perfect equality* in the distribution of capital stock.[11] This assumption is crucial for this part of our model. To examine the welfare effects in this model the labour endowment has been normalized to unity. The rental return from formal capital per worker can be treated as formal interest income. So total income of a particular worker(and also of the working class as labour endowment is normalized to unity) is his wage income plus formal interest income plus informal interest income. There is thus no difference between wage gap and the income gap. The following table summarizes the income distribution of the workers:

Income	$\overline{w} + r_{T.}T + rK_D$	$w + r_{T.}T + rK_D$
Frequency	L_y	$L_x + L_z$

Here $L_X = a_{LX}X, L_Y = a_{LY}Y,$ and $L_Z = a_{.LZ}Z$ implying the levels of employment in sectors 'x', 'y' and 'z' respectively.

[11] According to Gupta (1994a), the total population is actually treated as identical to total labour endowment so that it is classified into various types of working classes and there is no room for capital owners in the total population. So unless one considers workers are the owners of domestic capital stock it is not possible to show inequality in income distribution for the economy as a whole.

The welfare measure of Sen (1974), defined as the per-capita income multiplied by one minus the Gini-coefficient of income distribution, is an appropriate measure of the welfare of the workers. Thus we can write Sen (1974) type social welfare function as follows:

$$\Omega = \xi(1-G) \tag{15}$$

where Ω = welfare measure, ξ = per-capita income[12] and G = Gini-coefficient of income distribution. In this model

$$\xi G = (\overline{w} - w)p_i p_j \tag{16}$$

where p_i, p_j = relative frequencies of the income levels ($\overline{w} + r_{T.}T + rK_D$) and ($w + r_{T.}T + rK_D$) respectively.[13]

If we normalize the total labour endowment of the economy to 1 then we get,

$p_i = L_Y$ and $p_j = (L_X + L_Z)$,

Therefore, equation (16) can be written as,

$$\xi G = (\overline{w} - w)L_y(L_X + L_Z) \tag{16.1}$$

From the above equation we get,

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[12] Here per capita income is same as national income as total labour endowment is normalized to unity.

[13] The Gini-coefficient in general is given by $G = \frac{1}{2N^2\mu}\sum_{i=1}^{N}\sum_{i=1}^{N} f_i f_j \left|x_i - x_j\right|$, where μ is the mean. One can write it as $\mu G = \frac{1}{2}\sum_{i=1}^{N}\sum_{j=1}^{N} p_i p_j \left|x_i - x_j\right|$, where $p_i = \frac{f_i}{N}$ and $p_j = \frac{f_j}{N}$ are the relative frequencies. Division by 2 on the RHS implies that one part of the departure of the Lorenz curve from the egalitarian line has been considered. But when we write $\mu G = \sum_{i=1}^{N}\sum_{j=1}^{N} p_i p_j \left|x_i - x_j\right|$ the overall measure of inequality has been considered. Thus when N=1, $\mu G = p_i p_j \left|x_i - x_j\right|$. Here $\mu = \xi$, x_i = $\overline{w} + r_{T.}T + rK_D$ and $x_j = w + r_{T.}T + rK_D$, $p_i = L_X$, $p_j = (L_X + L_Z)$.

$$\hat{\xi} + \hat{G} = -\frac{wL_Y(L_X + L_Z)}{Gy}\hat{w} + \frac{(\overline{w} - w)L_Y}{Gy}(L_X + L_Z)\left\{\hat{L}_Y + \left(\frac{L_X}{(L_X + L_Z)}\hat{L}_X + \frac{L_Z}{(L_X + L_Z)}\hat{L}_Z\right)\right\} \tag{16.2}$$

Here $\hat{L}_X = (\hat{a}_{LX} + \hat{X})$, $\hat{L}_Y = (\hat{a}_{LY} + \hat{Y})$ and $\hat{L}_Z = (\hat{a}_{LZ} + \hat{Z}) = \hat{Z}$ as a_{LZ} is fixed

Now, due to FDI w rises and a_{Lj} s fall. We also know that such an FDI causes X to contract and both Y and Z to expand. Therefore, L_X falls, but the directions of the movements of L_Y and L_Z are ambiguous. Hence the effect of FDI on the measure on inequality is somewhat indeterminate. However, it may be inferred that, if there is a reduction in the level of L_Y and there is an increase in the level of L_Z (which is actually true as Z increases) so that the rate of reduction in the employment level of the formal sector (i.e. sector 'y') is greater than that of the weighted average of the expansion in aggregate employment level in the informal sectors (i.e. both sectors 'x' and 'z')[14] then we get a reduction in the value of the RHS of equation (16.2).[15]

Next we consider the national income as well as per-capita income of the economy (when total labour endowment of the economy has been normalized to 1) with full repatriation of foreign capital income as follows:

$$\xi = (\overline{w} - w)L_Y + wL + r_T T + rK_D \tag{17}$$

[14] It is to be noted that, given the labour endowment of the economy, if the formal employment level falls then the level of informal employment must rise.

[15] It is quite realistic to assume that the urban formal manufacturing (the production process of which is capital-intensive in nature) sector of a developing country sheds off labour drastically in response to a rise w; whereas the intermediate informal sector of the economy (which is comparatively labour-intensive sector), cannot reduce its unit labour requirement to a large extent due to a rise in w. Therefore, with the expansion of the output levels of both the formal and the informal manufacturing sectors, it can be said that employment level of workers in the formal sector falls whereas that in the informal sector rises.

From the above equation we get,

$$\hat{\xi} = \frac{(\overline{w} - w)L_Y}{\xi}\hat{L}_Y + \frac{w(L_X + L_Z)}{\xi}\hat{w} + \frac{r_T T}{\xi}\hat{r}_T + \frac{rK_D}{\xi}\hat{r} \qquad (17.1)$$

Here $\hat{w} > 0, \hat{r}_T < 0, \hat{r} < 0, \hat{L}_Y = \hat{a}_{LY} + \hat{Y} =$ ambiguous as $\hat{a}_{LY} < 0$ and $\hat{Y} > 0$.

Here the effect on per-capita income is also ambiguous. However, we can search for some sufficient conditions to get unambiguous results. For this we need to interpret each term of equation (17.1).The first term of the RHS of equation (17.1) implies the combination of wage differential effect along with the employment effect of sector ' y '. We call it the *labour reallocation effect*. If this employment effect is assumed to be negative (as assumed earlier) the first term on the RHS, i.e. *labour reallocation effect,* will be negative. The second term of the above equation is positive *wage income effect* on ξ as the competitive wage rate, w, increases due to FDI. The third and the fourth terms of the RHS of equation (17.1) imply that decrease in the returns from both types of capital (i.e. informal and formal capital) put negative impact on the per-capita income of the economy. We refer to them together as the *capital income effect*. However, if we assume that the *wage income effect* of the economy dominates over the sum of *labour reallocation effect* and *the capital income effect*, then we get the result that per-capita income of the economy increases due to FDI.[16]

Now, if ξ increases due to foreign capital inflow, then to maintain the equality condition of equation (16.2), G must fall which implies decrease in inequality of

[16] One very common characteristic of any developing country is scarcity of capital and stock of labour endowment is quite large.

income. Finally, an increase in ξ and a fall in G implies an increase in Ω, as we find from equation (15). We summarize our result in the form of the following proposition:

Proposition 2:- *If social welfare measure of Sen (1974), that incorporates the Gini-coefficient of income distribution, is considered then FDI (with full repatriation of foreign capital income) may reduce income inequality and raise social welfare of a small open economy, under some reasonable conditions.*

4. Concluding Remarks:

The present paper has examined the effects of a trade liberalization policy, in the form of FDI, on the level of wage earnings of the workers engaged in the informal sectors of a representative developing economy. We have considered here a three sector general equilibrium full employment model. It is assumed in this model that there exist two informal sectors and one formal sector in the developing economy. One of the two informal sectors is considered to produce a non-traded intermediate product which is used by the formal manufacturing sector of the economy. The intermediate product is produced using labour, informal capital and a negligible and fixed amount of formal capital. The other informal sector is considered to be a normal agricultural sector which requires labour along with informal capital to produce its product. The formal manufacturing sector of the economy requires labour, formal capital and a fixed amount of the intermediate product, produced by the informal manufacturing sector, in its production process. Here formal capital is assumed to be mobile between the formal and intermediate informal manufacturing sectors whereas labour is assumed to be mobile

between all the three sectors. Informal capital, on the other hand is assumed to be perfectly mobile between the two informal sectors.

In this scenario it is found that due to FDI the level of informal wage rate of the economy increases and hence it may be concluded that the standard of living of the workers engaged in the informal sector improves. It is also found in this paper that FDI expands the formal and informal intermediate–good producing manufacturing (urban) sectors whereas contracts the agricultural (rural) informal sector. Thus FDI creates a polarization in the economy not only with reference to the size of the urban and rural sectors but also with respect to their employment levels. Moreover, in this paper the effects on the levels of inequality of income distribution as well as social welfare due to FDI within the small open economy have also been discussed. For this purpose a Sen (1974) type welfare function has been considered. It is found in this paper that due to FDI inequality may fall and social welfare may improve within the economy under certain conditions. Thus the paper can be considered as a new attempt to examine the welfare conditions of the people in a small open economy as a result of FDI along with income inequality and standard of living.

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